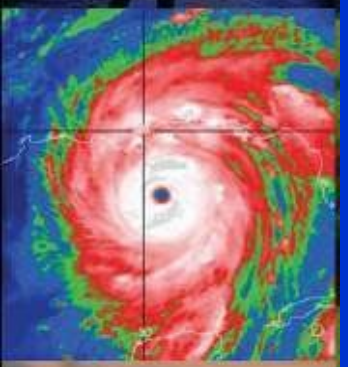
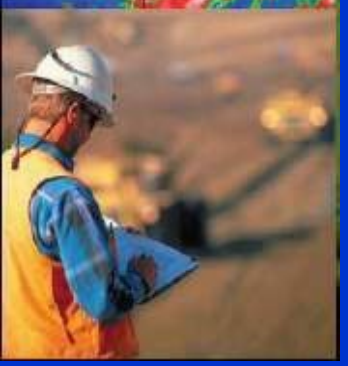



Using a Systems Approach for Nonstructural Plan Formulation Louisiana Coastal Protection and Restoration Study (LACPR)

Carol Hollaway
Institute for Water Resources

Planning Community of Practice Conference
USACE
San Antonio, TX
21 May 08

Background

- **Actions for Change, 26 Aug 2006**
  - Employ an integrated and comprehensive systems approach.
  - Employ risk-based concepts in planning.
- **Supplemental Policy Guidance Memo, 28 Aug 2006**
  - Conduct a comprehensive hurricane protection analysis
  - for risk reduction
  - using a comprehensive and integrated systems approach.
  - All recommendations must be shown to be a component of a comprehensive system.

Building Blocks of the LACPR System

1. Structural measures

   levees, floodwalls, gates, wiers

2. Coastal restoration measures

   wetlands, marsh

3. Nonstructural measures

   Buyouts/Permanent relocations

   Raising in place

   Hardening structures

Goals for Nonstructural Plan Formulation

- Primary goal:

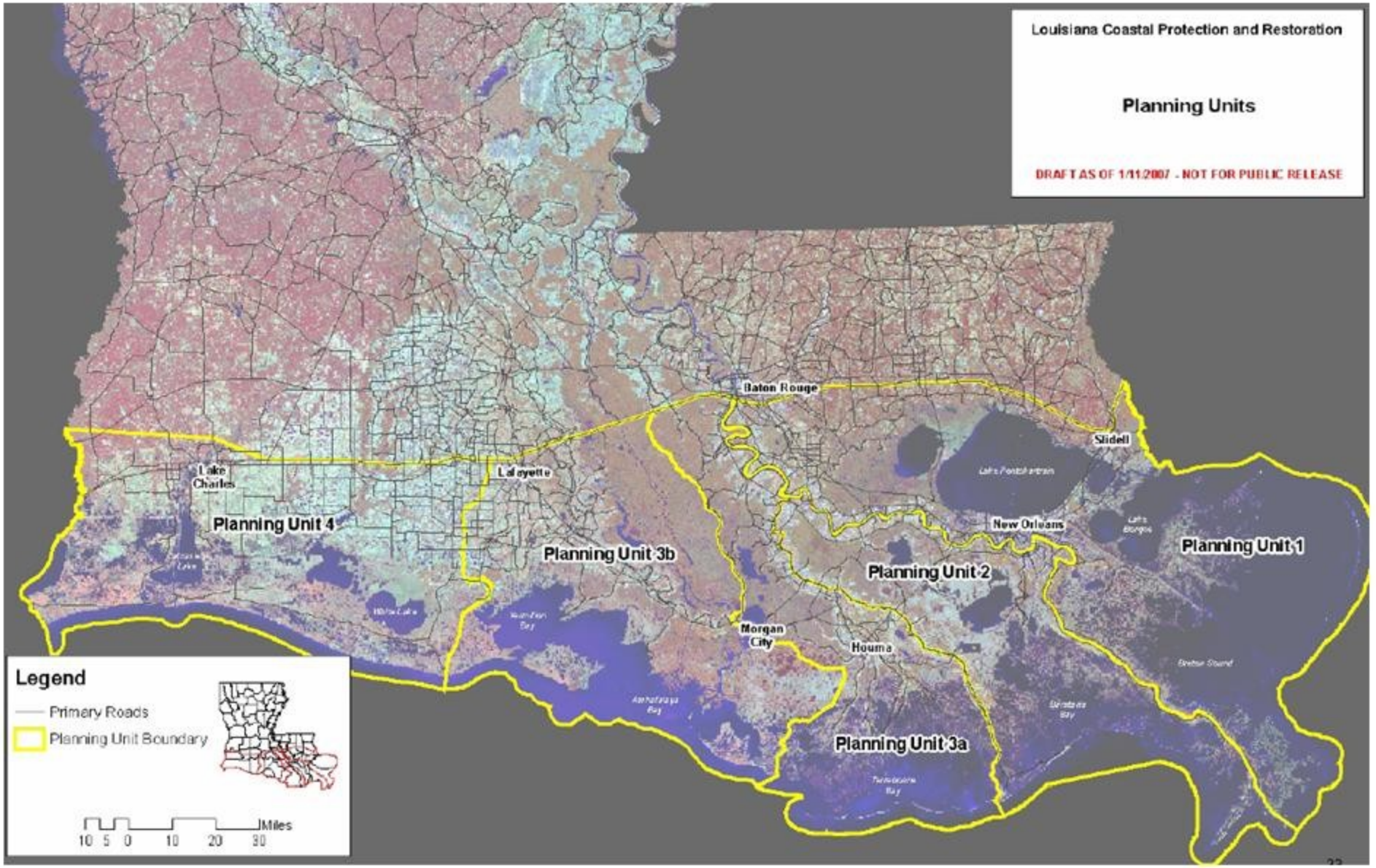
  Reduce risk to population and assets

- Secondary goal:

  Manage risk to critical facilities and economic assets

  Manage residual risk to population and assets

Spatial Extent of Plan Formulation



Nonstructural Measures

- Buyout/Permanent Evacuation
- Relocation/Moving Structures
- Elevation/Raising-in-Place
- Wet- and Dry-Flood Proofin
- Berms, floodwalls
- Flood Warning
- Changes in policies, practi

Functionality of Nonstructural Measures

- Stand alone risk reduction
- In combination with structural measures, provide

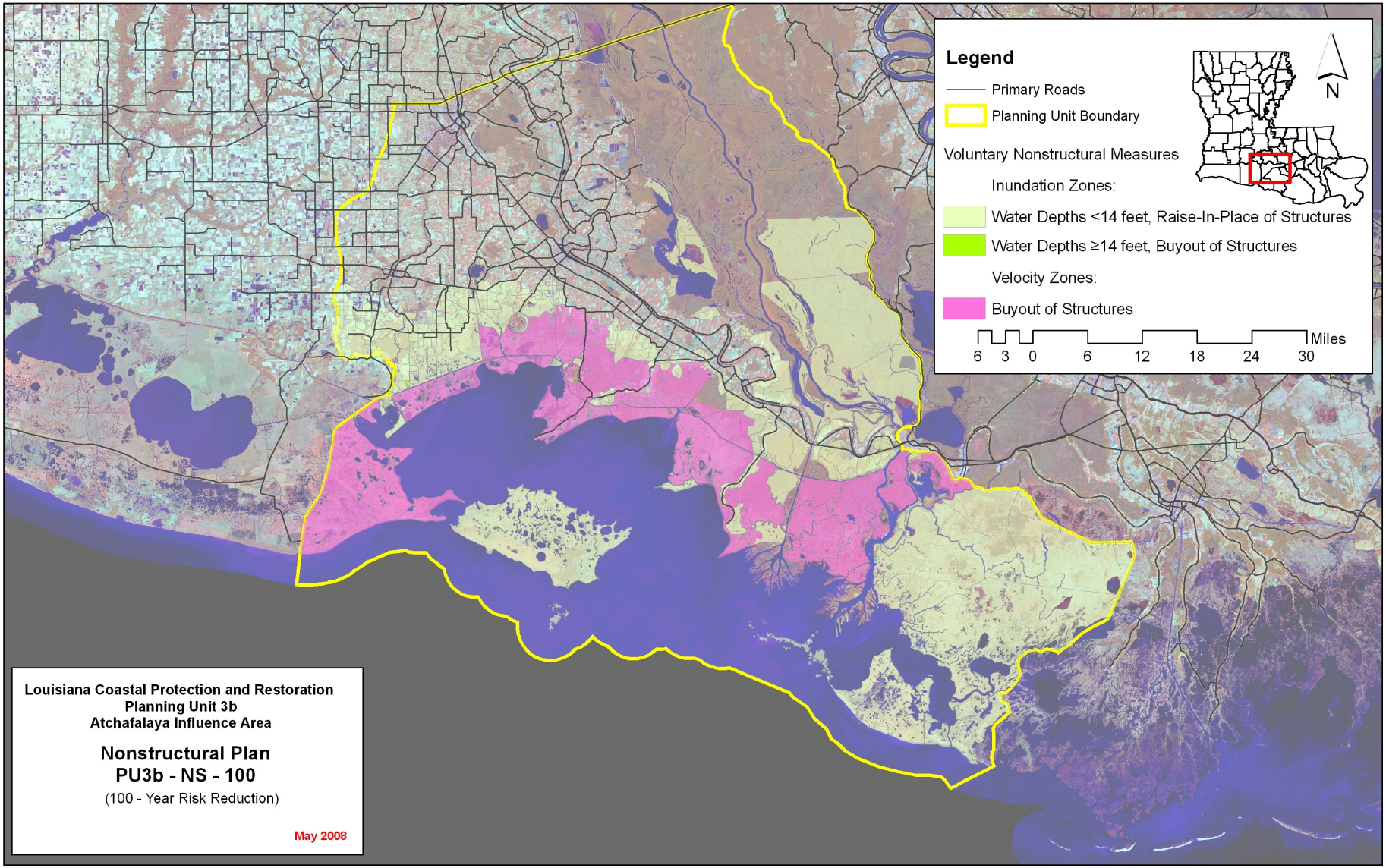
  Complementary risk reduction

  Interim risk reduction—pre-structural

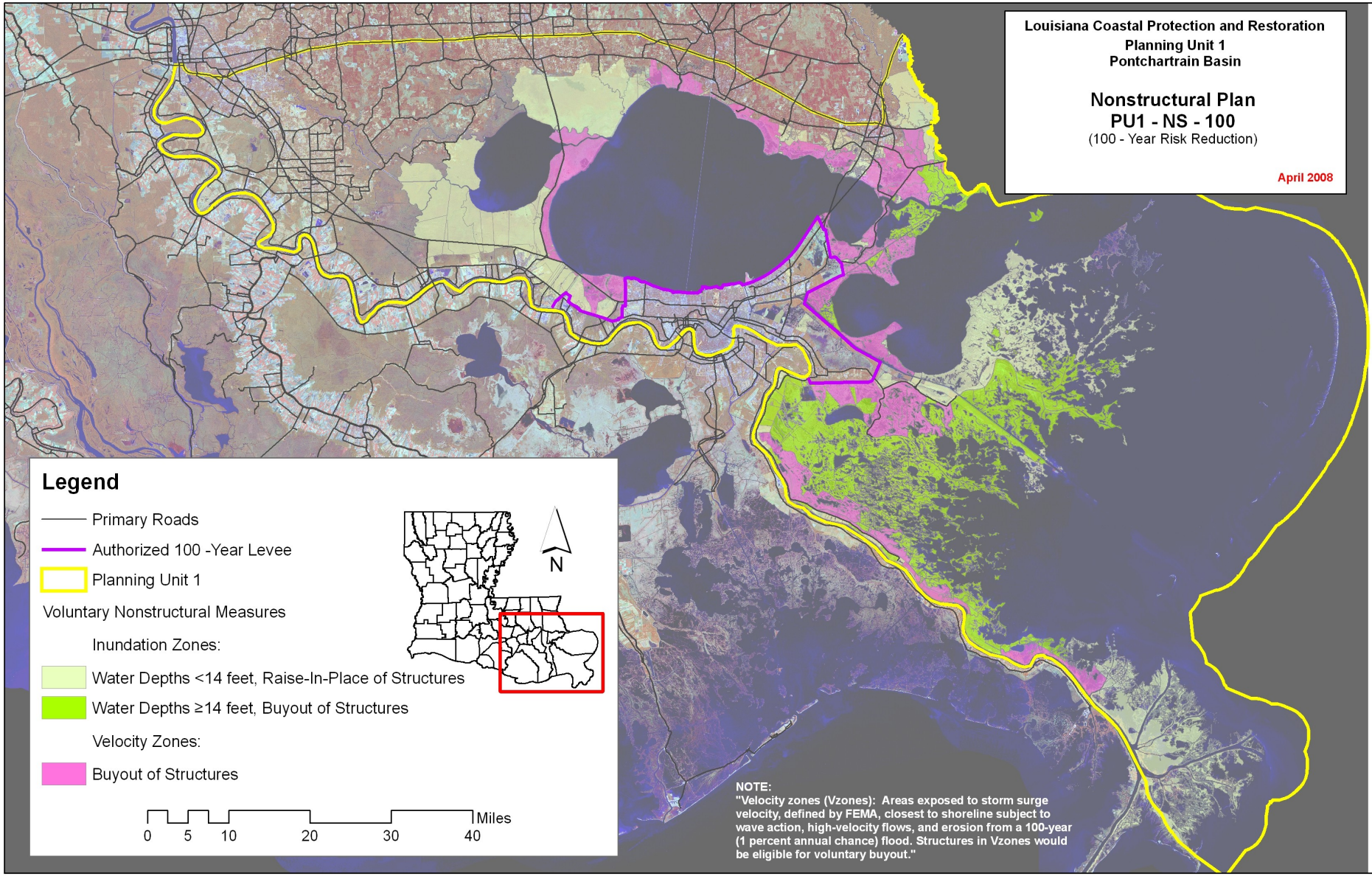
  Residual risk reduction—post-structural

  This approach addresses issues of system
    - » Redundancy—multiple lines of defense
    - » Reliability—fail-safe
- Support efforts for sustainable recovery

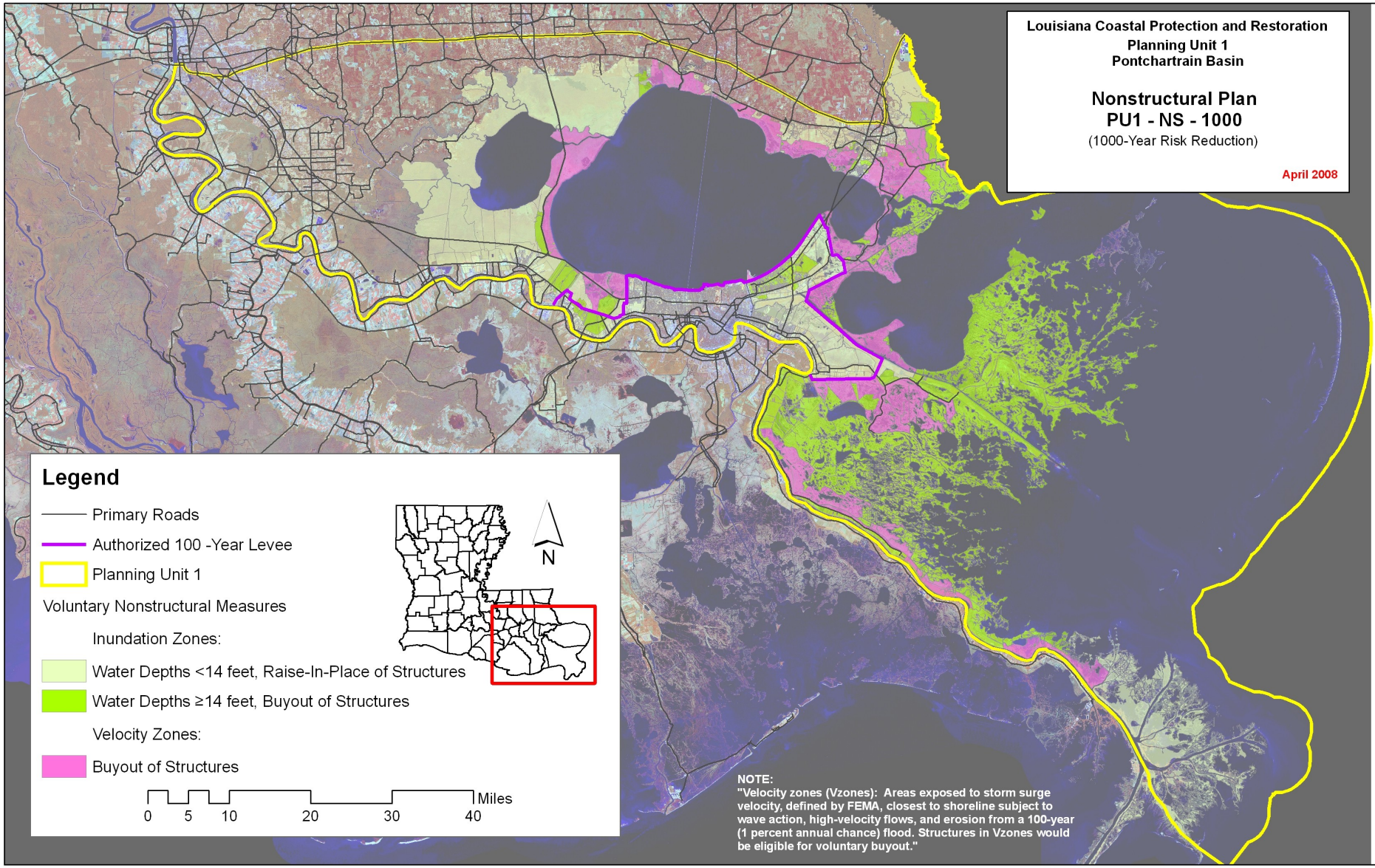
Example of Stand Alone Measure

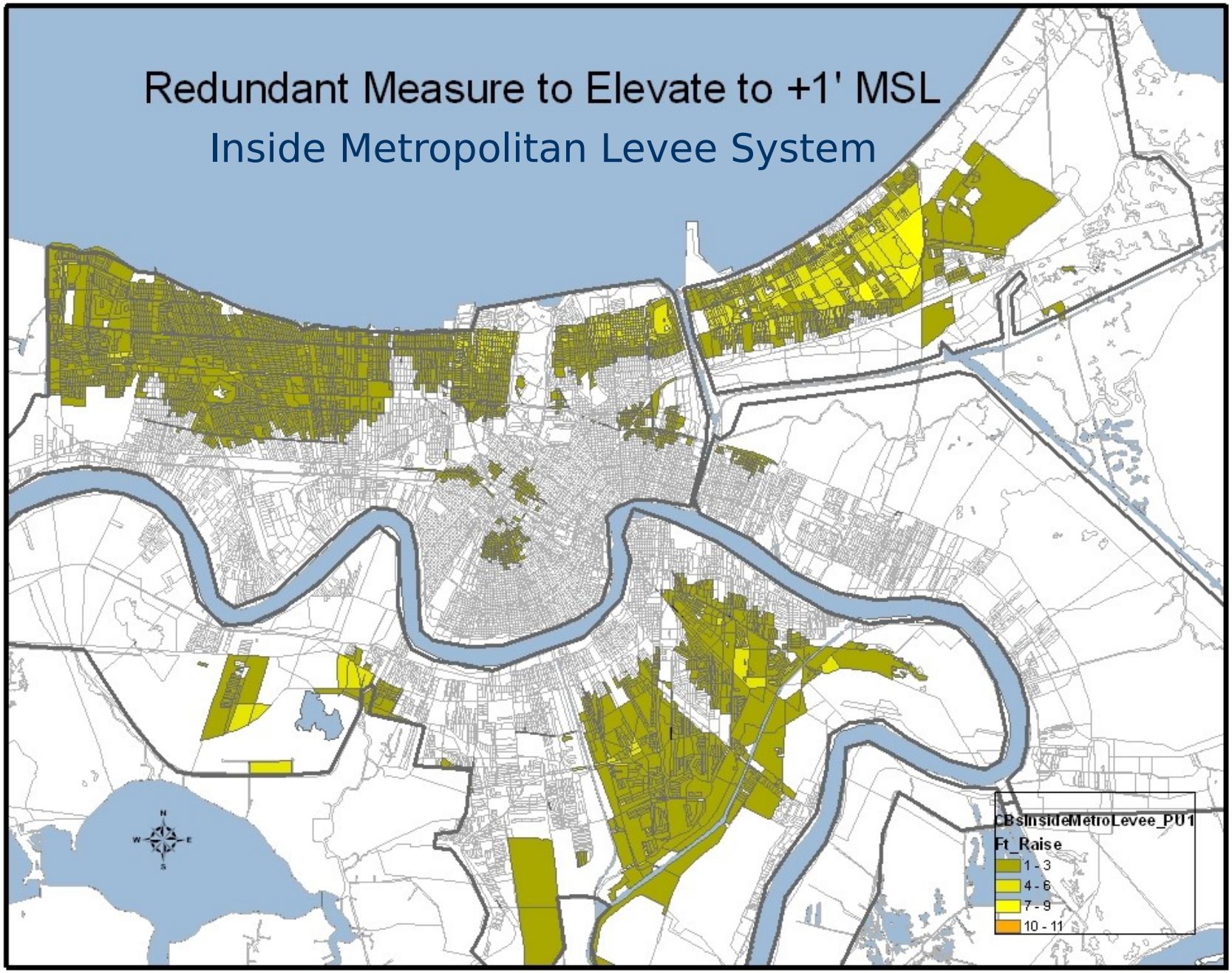


Example of Complementary Measure

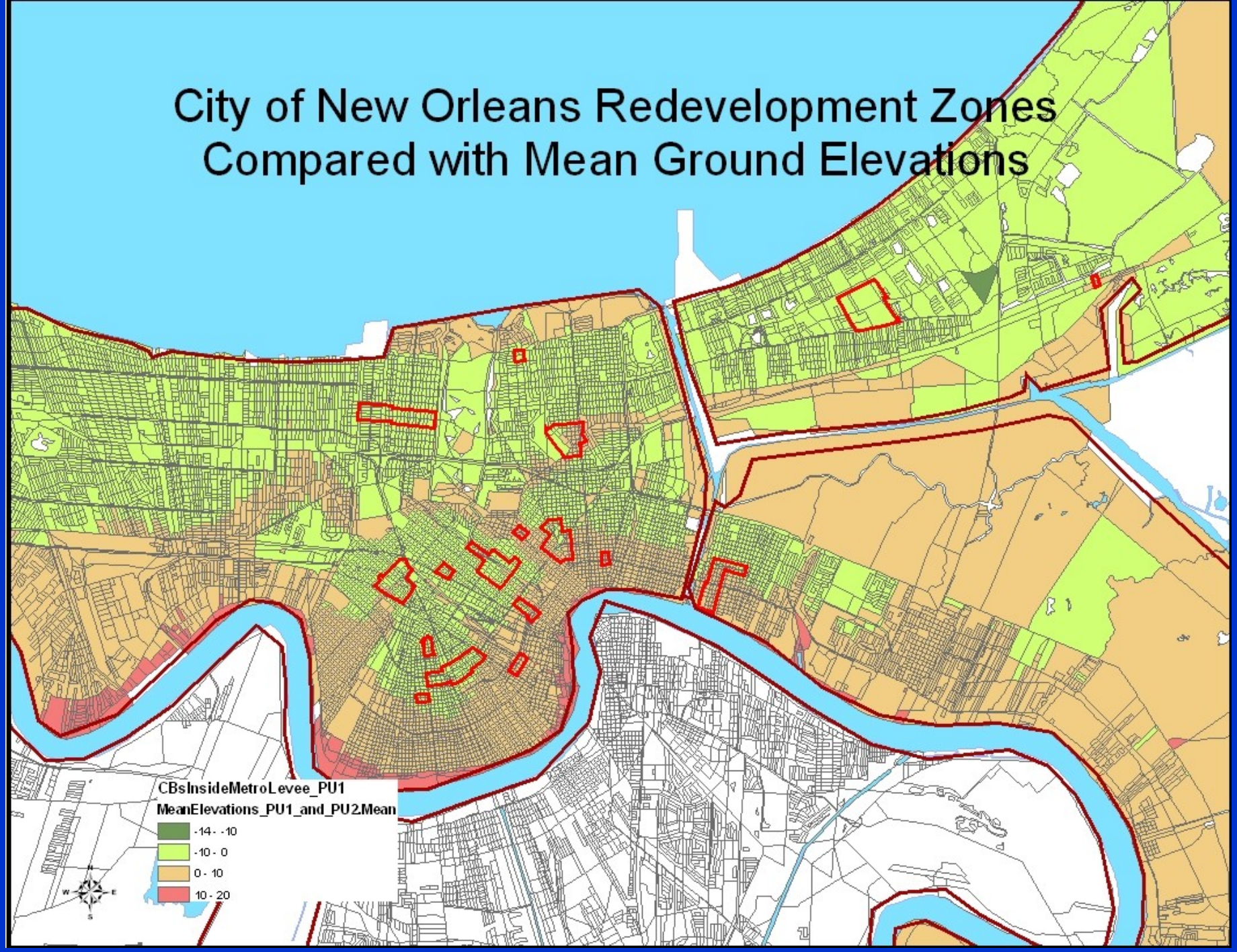

Louisiana Coastal Protection and Restoration
Planning Unit 1
Pontchartrain Basin
Nonstructural Plan
PU1 - NS - 100
(100 - Year Risk Reduction)
April 2008
Legend
Primary Roads
Authorized 100 -Year Levee
Planning Unit 1
Voluntary Nonstructural Measures
Inundation Zones:
Water Depths <14 feet, Raise-In-Place of Structures
Water Depths ≥14 feet, Buyout of Structures
Velocity Zones:
Buyout of Structures
N
0 5 10 20 30 40 Miles
NOTE:
"Velocity zones (Vzones): Areas exposed to storm surge velocity, defined by FEMA, closest to shoreline subject to wave action, high-velocity flows, and erosion from a 100-year (1 percent annual chance) flood. Structures in Vzones would be eligible for voluntary buyout."

Example of Residual Measure

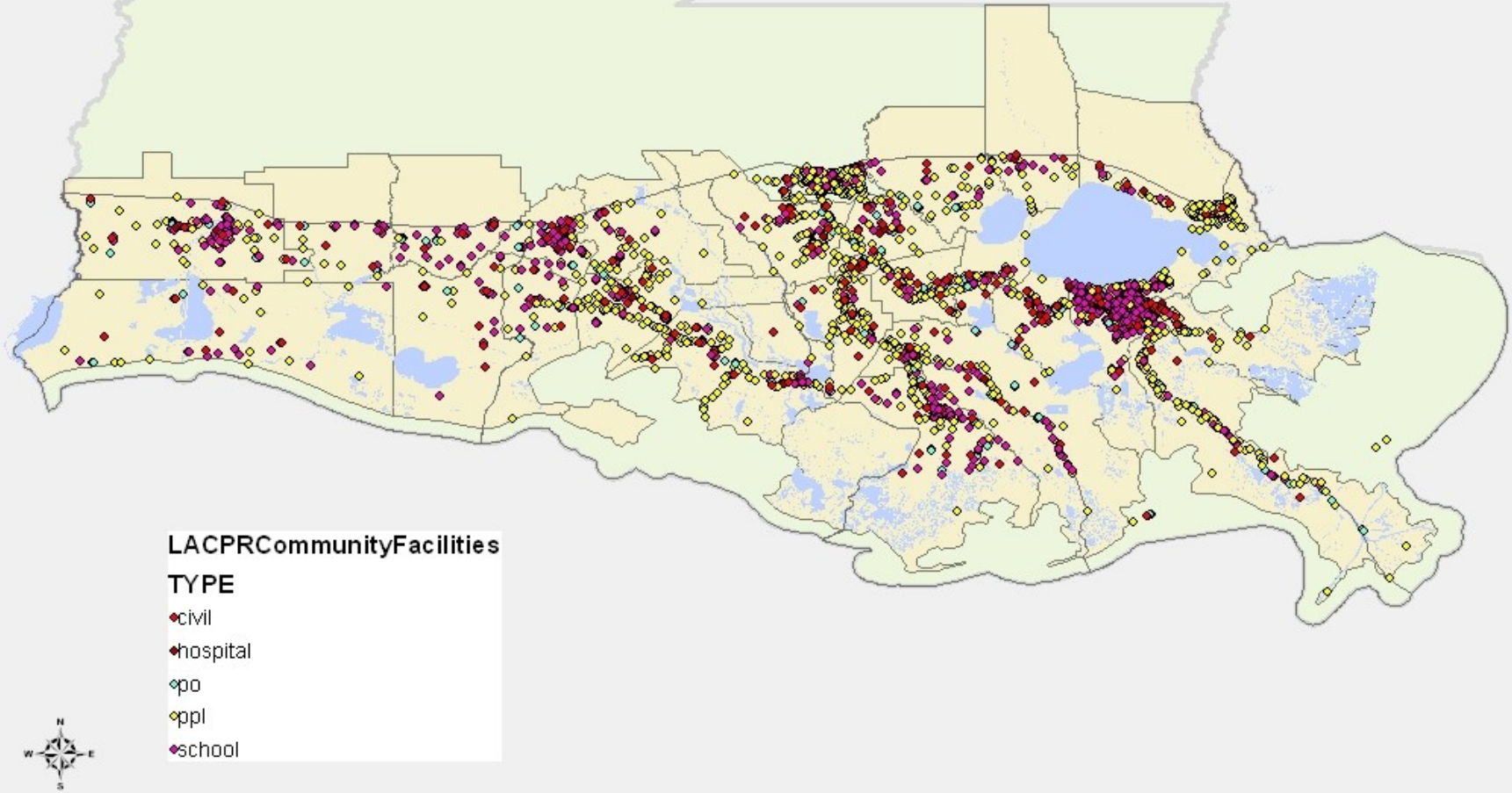

Louisiana Coastal Protection and Restoration
Planning Unit 1
Pontchartrain Basin
Nonstructural Plan
PU1 - NS - 1000
(1000-Year Risk Reduction)
April 2008
Legend
Primary Roads
Authorized 100 -Year Levee
Planning Unit 1
Voluntary Nonstructural Measures
Inundation Zones:
Water Depths <14 feet, Raise-In-Place of Structures
Water Depths ≥14 feet, Buyout of Structures
Velocity Zones:
Buyout of Structures
N
0 5 10 20 30 40 Miles
NOTE:
"Velocity zones (Vzones): Areas exposed to storm surge velocity, defined by FEMA, closest to shoreline subject to wave action, high-velocity flows, and erosion from a 100-year (1 percent annual chance) flood. Structures in Vzones would be eligible for voluntary buyout."


Redundant Measure to Elevate to +1' MSL
Inside Metropolitan Levee System
CBsInsideMetroLevee_PU1
Ft_Raise
1 - 3
4 - 6
7 - 9
10 - 11

City of New Orleans Redevelopment Zones Compared with Mean Ground Elevations



Distribution of Critical Facilites



Key Take Away Points

Systems approach to plan formulation

- Broadens perspective
- Creates opportunities for integration
  - within risk reduction system
  - within context taking into account objectives of stakeholders
- Addresses residual risk